This listing of claims will replace all prior versions and listings of claims in this application:

a.) Listing of Claims

1. (Currently amended) A method for generating a mathematical model of thermal steady state printing characteristics of a thermal printing system using a computing device, the thermal printing system comprising a thermal printer having a thermal head ~~(2)~~ incorporating a plurality of energisable heater elements ~~(4)~~ and a heat sink ~~(24)~~, and a thermographic material ~~(10)~~, said method comprising:

- making a reference printout on the thermographic material ~~(10)~~, said reference printout ~~consisting of~~ comprising several printed regions with each of the several printed regions being printed with a different steady state amount of heat energy ~~(E_n)~~ delivered to the heater elements ~~(4)~~,
- determining a measure of the graphical output ~~(d_n)~~ ~~in~~ as a function of at least a parameter relating to the heat sink temperature for each of the several printed regions measured in a zone of each region where the graphical output ~~(d_n)~~ was printed in a thermal steady state,
- establishing the mathematical model by determining a best fit relationship between the measures of the graphical output ~~(d_n) in~~ as a function of at least the parameter related to the heat sink temperature and the steady state amounts of heat energy ~~(E_n)~~.

2. (Currently amended) A method according to claim 1, wherein the heat energy E_n is represented by a given equivalent time (t_{exc}) used for powering the heater element ~~(4)~~ with an equivalent constant power (P_0), $E_n=t_{exc}*P_0$.

3. (Currently amended) A method according to claim 1, furthermore comprising, while making the reference printout, logging of parameters ~~(P_j)~~ that are determinative to the graphical output ~~(d_n)~~.

4. (Original) A method according to claim 1, comprising establishing a table (T) of data comprising the steady state graphical output function (d_n), and the used energy (E_n or t_{exc}) giving an implicit relationship between the graphical output function (d_n) and its controlling parameters (E_n or t_{exc}).

5. (Original) A method according to claim 4, the table (T) furthermore comprising the parameters (P_n) that are determinative to the graphical output (d_n).

6. (Original) A method according to claim 4, wherein the best fit relationship is a parametrisable function (f( )), being defined by a set of unknown coefficients (a,b,c,d, . . .) found using a curve fitting process on the table (T).

7. (Currently amended) The method according to ~~any of~~ claim 1, wherein a printing pattern of said reference printout is selected so that the pixels being printed do not interact with each other.

8. (Currently amended) ~~The~~ A method ~~according to claim 1~~ for generating a mathematical model of thermal steady state printing characteristics of a thermal printing system using a computing device, the thermal printing system comprising a thermal printer having a thermal head incorporating a plurality of energisable heater elements and a heat sink, and a thermographic material, said method comprising:

- making a reference printout on the thermographic material, said reference printout comprising several printed regions with each of the several printed regions being printed with a different steady state amount of heat energy (E_n) delivered to the heater elements,

- determining a measure of the graphical output (d_n) as a function of at least a parameter relating to the heat sink temperature for each of the several printed

regions measured in a zone of each region where the graphical output (d_n) was printed in a thermal steady state,

- establishing the mathematical model by determining a best fit relationship between the measures of the graphical output (d_n) as a function of at least the parameter related to the heat sink temperature and the steady state amounts of heat energy (E_n), wherein the best fit relationship is given by $d_i=f(t_{exc})$ where t_{exc} is an excitation time of a heater element and this relationship is corrected when using the printing system at a different line time by adding an offset Δt_{exc} to t_{exc}, .Δt_{exc} being found as the value that ~~full-fills~~ fulfills the equation

$$\sum_{l=0}^{\infty} \frac{1}{(2l+1)^2}\cdot\left[e^{-(2l+1)^2\left(\text{[illegible]}\right)} - e^{-(2l+1)^2\,\text{[illegible]}}\right] =$$

$$\sum_{l=0}^{\infty} \frac{1}{(2l+1)^2}\cdot\left[e^{-(2l+1)^2\,\text{[illegible]}} - e^{-(2l+1)^2\,\text{[illegible]}}\right].$$

9. (Original) The method according to claim 1, wherein said graphical output (d_n) is a pixel with a certain colour spectral density in the centre of the pixel and/or a pixel with a certain size defined by a perimeter having a given colour spectral density, to be reproduced on said thermographic material (10).

10. (Currently amended) A method for driving a thermal print head of a thermal printing system comprising a thermal printer having the thermal print head ~~(2)~~ incorporating a plurality of energisable heater elements ~~(4)~~ and a heat sink ~~(24)~~, and a thermographic material ~~(10)~~, said method comprising:

in a first mode establishing a mathematical model by:

- making a reference printout on the thermographic material ~~(10)~~, said reference printout ~~consisting of~~ comprising several printed regions with each of the several printed regions being printed with a different constant amount of heat energy ~~(E_n)~~ delivered to the heater elements ~~(4)~~,
- determining a measure of the graphical output ~~(d_n) in~~ as a function of at least a parameter related to the heat sink temperature for each of the several

printed regions measured in a zone of each region where the graphical output ~~(d_n)~~ was printed in a thermal steady state,

- establishing the mathematical model by determining a best fit relationship between the measures of the graphical output ~~(d_n)~~ and the constant amounts of heat energy, and, in a second mode:
- determining a heat energy to be supplied to at least one energisable heater element ~~(4)~~ in accordance with the mathematical model for printing of an image on a thermographic material ~~(10)~~ using a thermal printing system comprising a thermal printer having a thermal print head ~~(2)~~ incorporating a plurality of energisable heater elements ~~(4)~~ and a heat sink ~~(24)~~, and a current value of the parameter related to the heat sink temperature.

11. (Currently amended) A method according to claim 10, wherein the heat energy $\underline{E_n}$ is represented by a given equivalent time (t_{exc}) used for powering the heater element ~~(4)~~ with an equivalent constant power (P_0), $E_n=t_{exc}*P_0$.

12 (Currently amended) A method according to claim 10, furthermore comprising, while making the reference printout, logging of parameters ~~(P_j)~~ that are determinative to the graphical output ~~(d_n)~~.

13. (Original) A method according to claim 10, comprising establishing a table (T) of data comprising the steady state graphical output function (d_n), and the used energy (E_n or t_{exc}), giving an implicit relationship between the graphical output function (d_n) and its controlling parameters (E_n or t_{exc}).

14. (Original) A method according to claim 13, the table (T) furthermore comprising the parameters (P_n) that are determinative to the graphical output (d_n).

15. (Original) A method according to claim 13, wherein the best fit relationship is a parametrisable function (f( )), being defined by a set of unknown coefficients (a,b,c,d, . . .) found using a curve fitting process on the table (T).

16. (Original) A method according to claim 10, wherein a printing pattern of said reference printout is selected so that the pixels being printed do not interact with each other.

17. (Currently amended) A method ~~according to claim 10~~, for driving a thermal print head of a thermal printing system comprising a thermal printer having the thermal print head incorporating a plurality of energisable heater elements and a heat sink, and a thermographic material, said method comprising:

in a first mode establishing a mathematical model by:

- making a reference printout on the thermographic material, said reference printout consisting of several printed regions with each of the several printed regions being printed with a different constant amount of heat energy (E_n) delivered to the heater elements,
- determining a measure of the graphical output (d_n) as a function of at least a parameter related to the heat sink temperature for each of the several printed regions measured in a zone of each region where the graphical output (d_n) was printed in a thermal steady state,
- establishing the mathematical model by determining a best fit relationship between the measures of the graphical output (d_n) and the constant amounts of heat energy, and,

in a second mode:

- determining a heat energy to be supplied to at least one energisable heater element in accordance with the mathematical model for printing of an image on a thermographic material using a thermal printing system comprising a thermal printer having a thermal print head incorporating a plurality of energisable heater elements and a heat sink, and a current value of the parameter related to the heat sink temperature, wherein the best fit relationship is given by $d_i=f(t_{exc})$ where t_{exc} is an excitation time of a heater element and this relationship is corrected when using the printing system at a different line time by adding an offset $.\Delta t_{exc}$ to t_{exc}, $.\Delta t_{exc}$ being found as the value that ~~full-fills~~ fulfills the equation

$$\sum_{j=0}^{\infty} \frac{1}{(2j+1)^2} \cdot \left[e^{-(2j+1)^2 \text{[illegible]}} - e^{-(2j+1)^2 \text{[illegible]}} \right] =$$

$$\sum_{j=0}^{\infty} \frac{1}{(2j+1)^2} \cdot \left[e^{-(2j+1)^2 \text{[illegible]}} - e^{-(2j+1)^2 \text{[illegible]}} \right].$$

18. (Currently amended) A method according to claim 10, wherein said graphical output (d_n) is a pixel with a certain colour spectral density in the centre of the pixel and/or a pixel with a certain size defined by a perimeter having a given colour spectral density, to be reproduced on said thermographic material ~~(10)~~.

19. (Currently amended) A control unit for use with a thermal printer for printing an image onto a thermographic material, the thermal printer having a thermal head incorporating a plurality of energisable heater elements, the control unit being adapted to control the driving of the thermal printer so as to make a reference printout on the thermographic material, said reference printout ~~consisting of~~ comprising several printed regions, the driving of the thermal printer being such that each of the several printed regions is printed with a different constant amount of heat energy delivered to the heater elements, the control unit furthermore being adapted to determine a measure of the graphical output for each of the several printed regions measured in a zone of each region where the graphical output was printed in a thermal state, and the control unit furthermore being adapted to establish a mathematical model of thermal steady state printing characteristics by determining a best fit relationship between the measures of the graphical output and the constant amounts of heat energy.

20. (Original) A control unit according to claim 19, the control unit furthermore being adapted for determining a heat energy to be supplied to at least one energisable heater element in accordance with the mathematical model.

21. (Original) A thermal print head provided with a control unit according to claim 19.

22. (Original) A computer program product for executing the method as claimed in claim 1 when executed on a computing device associated with a thermal print head.

23. (Original) A machine readable data storage device storing the computer program product of claim 22.